



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

REGION 4

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October 23, 2007

Joy Broach  
Project Planning Branch  
U.S. Army Corps of Engineers, Nashville District  
P.O. Box 1070  
Nashville, Tennessee 37202-1070

**SUBJECT:** Draft Environmental Impact Statement for Center Hill Dam and Lake Project to Revise Operational Guide Curves and Pool Elevations in Dekalb County, Tennessee; CEQ Number 20070377

Dear Ms. Broach:

The U.S. Environmental Protection Agency (EPA) has reviewed the referenced Draft Environmental Impact Statement (EIS) in accordance with its responsibilities under Section 309 of the Clean Air Act and Section 102(2)(C) of the National Environmental Policy Act (NEPA). The Center Hill Project, owned and operated by the U.S. Army Corps of Engineers (USACE), is located on the Caney Fork River in DeKalb County, Tennessee. The Center Hill Dam is a combination earthen fill and concrete structure 2,160 feet long and 250 high. The average discharge from the dam is approximately 3,800 cubic feet per second (cfs). Center Hill Lake, created by the dam, has a drainage area of 2,174 square miles and a surface area of 18,220 acres.

Since construction of the dam in 1951, the concrete and earthen embankments have been plagued with increasing seepage problems. To address these problems, the USACE developed specific dam repair and remediation projects in 2005 and 2006. An Environmental Assessment (EA) was completed for each of these projects. At the time, no significant changes to the normal pool elevations were considered necessary. However, the repairs identified will take a number of years to complete and the risk of potential dam failure will increase during this time. Therefore as a proactive measure, the USACE proposes to evaluate different interim lake elevations to reduce the hydrostatic pressure and potential risk of dam failure. The purpose of the EIS is to analyze possible impacts resulting from interim pool elevation alternatives and an unscheduled emergency drawdown that could occur during 7-10 years of repairs to the dam. When repairs are complete, Center Hill Dam and Lake would return to normal operations.

Lake levels at Center Hill Lake have historically been managed in accordance with the Center Hill Project Guide Curve. This operations guidance divides the lake into distinct pools (layers) based on three congressionally-authorized elevations (EL 685, 648, and 618) which form boundaries for project operations throughout the year. The bottom layer of Center Hill Lake is the inactive storage pool (from the bottom of the reservoir up to EL 618). The next zone is the power pool, which is a 30-foot "normal operating zone" between EL 618 and 648. This is the zone in which water is stored for hydropower and other project purposes. The flood control pool

extends from EL 648 to EL 685. The normal condition is for this pool to remain empty so that space is available for flood water storage. Overall normal project operations have historically followed a guide curve within a "Power Marketing Band" (PMB), which falls within the power pool and represents the optimal range for power generation. The normal summer pool elevation is EL 648, and the normal winter pool elevation is EL 623.5. However, the USACE has recently modified operations to manage the lake levels at a normal maximum pool elevation of EL 640, aggressively adhering to the bottom of the PMB to reduce the risk of dam failure. For the purposes of the Draft EIS, this is considered the no action alternative. A total of nine interim pool elevation alternatives (e.g., temporary operating bands or guide curves) were evaluated in the Draft EIS, ranging from maintaining Center Hill Lake at normal levels to an emergency drawdown to EL 496. No overall preferred alternative was identified.

In general, EPA supports the purpose and need for the action proposed in the Draft EIS. EPA understands that lake levels must be managed as part of dam remediation activities to first and foremost maintain public safety and minimize the risk of dam failure. However, EPA has environmental concerns with some of the alternatives related primarily to water quantity and water quality in the reservoir and project dam releases. To assist in the identification of a preferred alternative, EPA requests additional risk assessment information related to the difference in dam failure risk for each of the proposed alternatives. EPA offers the following specific comments for your consideration in development of the Final EIS for this project:

#### Alternatives

EPA is unclear of some of the terminology associated with a few of the alternatives. Alternative 1 is described as the "normal operating band," i.e., how the lake has historically been operated. It is assumed that after repairs are complete, the lake would once again resume "normal" operations as described in Alternative 1. Since the purpose of the project is to develop interim lake levels that deviate from normal operations, why is this alternative not considered the no action alternative? Alternative 3 is described as the "no action alternative." It is unclear why Alternative 3 would not be considered an action alternative, since it involves drawing the lake down below normal levels, and it has only been utilized as an operating approach since December 2006. Also, Alternative 4 is described as the "environmentally preferred alternative." However, the Draft EIS concludes that Alternative 4 would moderately to severely impact water quality, which in turn would negatively impact water supply and fisheries. The low water elevations could adversely affect fish spawning in the lake. How is this alternative considered environmentally preferred? Finally, Alternative 5 is described as the "Dam Safety and Engineering Preferred Alternative." Is this the USACE overall preferred alternative for managing lake levels during dam repairs? These issues should be explained and addressed in the Final EIS.

#### Water Quality/Water Quantity

EPA has environmental concerns related to implementation of lake levels (and downstream releases) associated with Alternatives 5 through 9. The Draft EIS states that Alternative 4 represents a breakpoint below which the negative environmental impacts of the alternatives change from predominately minor/moderate to moderate/severe, especially in the

areas of water quality and fish and wildlife. EPA agrees with this assessment. At the lower operating bands, virtually all project purposes except for flood control would be moderately to severely impacted. Water quality, particularly dissolved oxygen (DO) and temperature, would become major concerns, especially in the project tailwaters. The fisheries both in the lake and in the tailwater would be stressed. Poor water quality together with algal and bacterial blooms would require additional processing by municipal water suppliers. From a recreation standpoint, many boat ramps would be unusable at various times of the year. If the USACE selects any of these alternatives, it appears that discharges from Center Hill Lake, downstream of the dam, will not meet state water quality standards for dissolved oxygen (DO) during mid to late summer. Therefore, EPA recommends immediate implementation of the mitigation measures described in Section 2.4 to ensure that discharges from the project meet state water quality standards. See additional comments on mitigation and monitoring below.

Water quantity is an important consideration for water supply and water quality. It is understood that lowering pool elevations would increasingly benefit flood storage; however, the availability of water quantity downstream and upstream of the Center Hill Project could be greatly reduced. Alternative 4 would supply approximately 54% of the water quantity minimally needed for all project uses, the system, and drought conditions. This drops off significantly in Alternatives 5 through 9. There is no discussion of the potential water supply impacts within the reservoir for Alternative 5 during the winter drawdown, similar to what is described for Alternative 7. In addition, there is no discussion of the potential impacts to the water supply intake located downstream of the dam for any of the alternatives. There is also no discussion of the potential impacts to the downstream municipal and industrial discharges into the Caney Fork River below the dam, as a result of reduced downstream flows from any of the alternatives. EPA recommends that the Final EIS include additional discussion of the water quantity and quality impacts.

#### Mitigation and Monitoring Measures

A number of potential mitigation measures are described in Section 2.4 for the Center Hill Project. It is unclear whether these measures are being proposed as part of this action or are existing commitments from other related dam remediation activities. For example, Section 2.4.1 references the potential installation of an orifice gate over a sluice gate to provide continuous minimum flows with high levels of dissolved oxygen (DO). However, other sections of the Draft EIS reference this as an existing commitment that includes installation and operation of an orifice gate in Fall 2007. Similarly, Section 2.4.2 references a release operations protocol that involves blending turbine and sluice gate discharges to ensure adequate DO is achieved in project discharges during the warmer summer months. However, Section 3.7 suggests that the USACE implemented this protocol in 2005.

EPA recommends that the Final EIS clearly identify the specific mitigation measures and any monitoring efforts that will be implemented at the Center Hill Project associated with the changes in lake elevations from dam remediation efforts. From a water quality standpoint, there is little information in the Draft EIS that describes current water quality monitoring associated with project. EPA supports an overall monitoring approach following completion of the EIS process that includes rigorous DO and temperature monitoring and a commitment to pursue

additional DO enhancement measures based on the results of this monitoring. EPA is interested in water quality monitoring in the project area to determine compliance with state water quality standards, especially during this time of changing project conditions. Monitoring should be utilized to determine the impacts of the changes in lake elevations, associated flow releases, and other project changes on water quality. EPA recommends that the Final EIS include a project operations and flow monitoring plan that includes water quality monitoring to support such an objective, if this is not already in place.

From a cumulative impacts standpoint, since similar restrictions are being considered for Wolf Creek Dam and Lake Cumberland, EPA strongly recommends that the USACE develop interim changes to the operating protocols at other lakes in the Cumberland watershed to provide supplemental flows, as necessary, as described in Section 2.4.3. EPA also recommends that the USACE consider including a “mitigation” measure related to public outreach during this time of interim operations. This commitment could include more detailed, up-to-date monitoring information (reservoir levels, downstream flows, etc.) on a publicly available website to inform the public of current operations, the status of repairs, and any proposed changes to lake levels (immediate or longer-term) that are necessary as a result of dam distress monitoring. This would be a part of the adaptive management approach described below. These measures and a proposed implementation schedule should be included in the Final EIS.

#### Preferred Alternative

The Draft EIS states that the, “risk is reduced with each successive alternative.” Therefore, it appears that the lower the reservoir levels, the lower the risk of dam failure. However, there is no information to inform the public or decisionmakers related to the degree of change in the risk for each of the alternatives. For instance, by how much would the risk of dam failure be reduced under each of the alternatives? EPA recommends that the Final EIS include more detailed risk analysis that considers alternative reservoir restriction levels coupled with the risk of dam failure/downstream consequences to better assist in selecting a preferred alternative of reservoir drawdown and operations restrictions.

Without any additional information to describe the risk of dam failure between the alternatives, EPA recommends that the USACE consider an aggressive adaptive management regime for managing lake levels during dam repairs, similar to how the system appears to be managed currently. Based on the information in the Draft EIS, it would appear that Alternative 3 should be selected as the initial preferred alternative, coupled with thorough monitoring and the ability to allow for deviations to lower lake levels based on the identification of distress indicators. Since going to the modified operating guide curve represented by Alternative 3, high peaks of pressure on the main and saddle dam foundations, earth embankments, and right and left rim walls have been markedly reduced. There has also been a documented reduction in the size of wet spots at the embankment toe and a marked decrease in the flows from the springs immediately below the dam that serve as seepage indicators. From this description, it would appear that the risk of dam failure has been significantly reduced by following the lake level operations protocol for Alternative 3.

The Draft EIS states that a Section 401 State Water Quality Certification or Aquatic Resources Alteration Permit will not be required for altering lake levels. Was this decision developed in consultation with the State of Tennessee? Given the potential for significant impacts to water quality, depending on which alternative is selected, EPA recommends that the USACE coordinate with the Tennessee Department of Environment and Conservation, Division of Water Pollution Control, prior to selection of the preferred alternative to ensure state water quality considerations are included in the final decision.

We rate this document EC-2 (Environmental Concerns – additional information requested). Enclosed is a summary of definitions for EPA ratings. We have concerns that the proposed action identifies the potential for impacts to the environment that should be avoided/minimized. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. We appreciate the opportunity to review the proposed action. Please contact Ben West of my staff at (404) 562-9643 if you have any questions or want to discuss our comments further.

Sincerely,

A handwritten signature in black ink, appearing to read "Heinz Mueller", with a stylized, cursive script.

Heinz J. Mueller, Chief  
NEPA Program Office  
Office of Policy and Management

cc: Tennessee Department of Environment and Conservation